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ABSTRACT

Using survey research methodology in rating "believability" of computers, this study concludes that English Canadians tend to find computers more credible than do Frencn Canadians. The two variables that affected the subjects' attitudes were an affectively positive awareness of the computer's pragmatic abilities and an affectively negative fear of potential computer misuse. Demographic variables such as social class, age, sex, and language mediate the computer credibility phenomenon. (CH)

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MAN-MACHINE COMMUNICATION: COMPUTER CREDIBILITY FOR FRENCH AND ENGLISH CANADIANS

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a paper

by

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MAN-MACHINE COMMUNICATION: COMPUTER CREDIBILITY FOR FRENCH AND ENGLISH CANADIANS

The purpose of this study is to compare the credibility that French and English Canadians attribute to the computer, the predominant symbol of modern technology. Few Canadians have escaped the pervasive influence of the computer as demonstrated by the fact that 72% of the Canadians surveyed by the Social Survey Research Center (1972) had received some form of computer printout in their homes. The Research Center Report began the long process of describing the 'interpersonal symbolic relationship' Canadians share with the computer. This study continues the descriptive process and investigates the credibility dimension of man-computer communication.

Computer Credibility

Credibility refers to "the impressions or images people hold towards a message source - whether a person, a medium, or an institution" (Mortensen, 1972, p. 143). Licklider (1968), Etzioni (1968) and Umpleby (1972) view the computer as a fourth generation mass medium and, consequently, the computer medium should elicit credibility reactions.

A review of the literature reveals that computers do, indeed, elicit impressions and images; the components of credibility. The body of man-computer research suggests that the impressions and images which people have of computers hinge upon two factors; an affectively positive awareness

of the computer's pragmatic abilities and an affectively negative fear of potential computer misuse. Moreover, demographic variables such as social class, age, sex, and language mediate this computer credibility phenomenon.

The ensuing review of the literature establishes a foundation for predicting that French Canadians will attribute lower credibility to the computer than English Canadians. An analysis of the North American computer reaction norm plus an analysis of its demographic antecedents will establish a foundation for the study's prediction.

The Computer Reaction Norm

Research suggests that impressions and images of the computer reflect two underlying dimensions; a realization of the benefits of computer technology and an awareness of the computer's abuse potential. The Report of the Social Survey Research Center (1972) and research by Lee (1970), Time (1971), and Taviis (1972) have isolated these two dimensions.

The Report of the Social Survey Research Center (1972, p. 1) to the Canadian Department of Communication Task Force on Man Computer Communication concluded that:

> the overwhelming majority of people, to some degree live with two sets of conflicting attitudes toward computer technology. On the cognitive level, most people can perceive, appreciate and accept the benefits to the world society resulting from the scientific and technological progress. On the emotional or affective level, most people harbour fears and anxieties about what the results of this progress will mean to them personally and to their interpersonal relationships.

Parallel dimensions emerge from three American studies. Lee (1970) surveyed American attitudes towards the computer and found both the

pragmatic view that the computer served as a helpful instrument in science, industry, and space exploration and the awed view that the computer could autonomously perform human functions. Irene Taviis (1972) surveyed popular attitudes towards the computer in New England and isolated two groups, the pro-technocrats and the anti-technocrats. The former saw more benefit than harm in computers and other technologies which bring comfort, awareness, and efficiency. The latter group felt that man could become too dependent on machines which might have the effect of reducing individual effectiveness and increasing isolation. She also found that the majority of her sample held a pro-technocrat position much as did the sample of a Time (1971) survey. These and other studies isolated antecedent variables which influence the impressions and images which people have toward the computer.

Antecedents to the Computer Reaction Norm

Research tells that social class, age, sex, and language influence the impressions and images which people have toward the computer.

Social Class. Most researchers agree that positive reactions to the computer tend to reside in the middle and upper social classes to a greater degree than in the lower classes. Professional and managerial level Canadians view the computer as a highly efficient mathematical machine while Canadian blue collar workers tend to view it as just another appliance (Report of the Social Survey Research Center, 1972). Lee (1970) reported similar results in respect to the general American population as did Reznikoff, Holland, and Stroebel (1967), Friel, Reznikoff, and Rosenberg (1969), and Startsman and Robertson (1972)

from the medical arena.

Age. Canadians under 50 years of age tend to have more positive reactions to the computer than those over 50 (Report of the Social Survey Research Center, 1972) and Americans between 30 and 39 hold attitudes of a more positive nature than those between 19 and 29 as well as between 50 and 70 (Taviis, 1972). Rosenberg, Reznikoff, and Stroebel (1967) found that hospital employees with less than 10 years experience reacted more positively to the computer than those with more than 10 years of experience.

Sex. Reactions to the computer vary with one's sex. For example, Canadian men react more positively to the benefits and less fearfully to the potential abuse of computers than do Canadian women (Report of the Social Survey Research Center, 1972). The same holds true for males and females in the hospital enviroment (Reznikoff, Holland, and Stroebel, 1967; Startsman and Robinson, 1972).

Language. The Social Survey Research Center (1972) compared the reactions of French and English Canadians to the Computer and found that French Canadians reacted more negatively to the computer than did English Canadians. The French Canadians viewed the computer as a potential threat to individuality, a cause of further unemployment, and a powerful tool in the hands of the well to do. "Unconsciously, of course, this gives rise to hostilities and frustrations of a sociological nature which manifest themselves as blame for the concept (computer)." (Report of the Social Survey Research Center, 1972, p. 19).

Perhaps the negative reaction of French Canadians to the computer relates to the power and authority they attribute to the computer.

The Report of the Social Survey Research Center (1972, p. ii) tells us that:

> Among some French speaking respondents the computer appears to be perceived as some sort of "super machine", "la savante" (the knowledgable one), "machine ideale" (super machine). At the same time the level of specific knowledge about computers is remarkedly lower in Montreal (French Canada) than Toronto (English Canada).

The Report based its conclusion on the facts that 53% of French Canadians feel that there is almost no limit to the potential of computers; 35% feel that computers can make decisions better than can humans, and 14% feel that computers can think the way humans can. It follows that French Canadians view the computer as an authority figure, an authority figure towards which they hold hostile feelings. This conclusion remains consistent with Ryan's (1972) finding that French Canadians hold attitudes of greater hostility to authority than English Canadians.

Prediction

It appears that French Canadians share less of the positive dimension and more of the negative dimension of the North American computer reaction norm than English Canadians. Thus, the following prediction seems in order, assuming one controls for social class, age, and sex: French Canadians will attribute less credibility to the the computer than English Canadians.

METHOD

Respondents

Respondents were 120 undergraduate students enroled in summer session courses in the humanities and social sciences at the Universite de Quebec, Sir George Williams University, and Loyola of Montreal. Most respondents were engaged in full time occupations and, thus, were only part-time students.

The respondents categorized themselves according to their first language and of the 120, 30 spoke French and 30 spoke English. These French and English groups were matched on religious affiliation and sex.

Research Instrument

Respondents rated the concept, 'computer', on French and English versions of McCroskey's (1972) 17 item credibility scale which measures the competence, extroversion, character, and composure of peers and organizations. The scale has a test-retest reliability of 0.90 (n = 2200).

Translation. Two bilingual Canadians translated the English version of the McCroskey credibility scale into French. One translator holds certification as a French instructor and the second is active in Montreal business. This combination of translators assured a product which reflects academic legitimacy and popular usage.

Coding. Coding ranged from negative to positive such that a score at the negative pole received a numerical value of one and a score at the positive pole received a numerical value of seven. The overall credibility scores as well as the credibility scores for each subdivision of the scale were summed for each individual prior to analysis. The overall summation yielded a possible range of 17-119, the competence and extroversion dimensions yielded a possible range of five to 35, the character dimension yielded a possible range of four to 28, and finally the composure dimension yielded a possible range of three to 21.

Procedure

The researcher, with the help of the class professor, distributed the research instrument prior to the lecture and summarized the letter of introduction which preceded the credibility scale.

Analysis

The data were analysed in three stages by means of t tests. First, a t test compared the reactions of French and English Canadians to the computer on overall credibility; second, t tests compared the reactions of the two language groups on the competence, extroversion, character, and composure they attribute to the computer; and, third, t tests compared them on each of the 17 items comprising McCroskey's scale. The first step tested the research hypothesis while the second and the third steps offered a profile of French and English Canadians' impressions and images of the computer.

TABLE 1

t TEST OF CREDIBILITY ATTRIBUTED TO THE COMPUTER BY FRENCH AND ENGLISH CANADIANS

DIMENSION	X_f	$\sigma_{\bar{x}}$	X_e	$\sigma_{\bar{x}}$	t	P
CREDIBILITY	67.1333	2.5500	74.3666	2.4938	2.0279	0.050*

*P < 0.05

TABLE 2

t TESTS OF THE COMPETENCE, EXTROVERSION, CHARACTER, AND COMPOSURE ATTRIBUTED TO THE COMPUTER BY FRENCH AND ENGLISH CANADIANS

DIMENSION	X_f	$\sigma_{\bar{x}}$	X_e	$\sigma_{\bar{x}}$	t	P
COMPETENCE	22.3333	1.0014	26.7333	0.9045	3.2604	0.005**
EXTROVERSION	19.5000	1.1302	21.8333	0.9235	1.5985	0.100
CHARACTER	12.9333	1.0805	13.1000	0.8687	0.1202	
COMPOSURE	12.4000	0.7783	13.2000	0.8728	0.6841	0.300

**P < 0.01

TABLE 3

t TESTS BETWEEN FRENCH AND ENGLISH CANADIANS ON THE 17 COMPUTER CREDIBILITY ITEMS

DIMENSION	X_f	$\sigma_{\bar{x}}$	X_e	$\sigma_{\bar{x}}$	t	P
INTELLIGENCE	2.5333	0.4171	4.8666	0.3887	4.0927	0.0005***
INTELLECTUAL	2.0333	0.3405	4.2000	0.4079	4.0773	0.0005***
LOGICAL	5.1333	0.4144	6.0333	0.2557	1.8480	0.0500*
EXPERT	6.3333	0.2459	5.7333	0.2441	1.7316	0.0500*
QUALIFIED	6.0000	0.2711	5.9666	0.2321	0.0935	
VERBAL	2.5333	0.3448	3.5666	0.3577	2.0799	0.0250*
TALKATIVE	2.8000	0.3964	3.3666	0.3439	1.0799	0.2000
BOLD	4.8333	0.4524	4.6333	0.3268	0.3583	
ACTIVE	5.8333	0.4098	5.7333	0.3420	0.1873	
EXTROVERTED	3.4666	0.4144	4.6333	0.2688	2.3617	0.0250*
SOCIABLE	2.1333	0.3133	2.9000	0.3661	1.5909	0.1000
SYMPATHETIC	2.9310	0.4028	2.1666	0.2996	1.5227	0.1000
NICE	3.1333	0.3579	4.1000	0.3119	2.0364	0.0500*

*P $<$ 0.05
***P $<$ 0.001

TABLE 3 (continued)

DIMENSION	X_f	$\sigma_{\bar{x}}$	X_e	$\sigma_{\bar{x}}$	t	P
PLEASANT	4.7000	0.3839	4.1333	0.2944	1.1713	0.2000
RELAXED	4.1666	0.3653	4.0666	0.3741	0.1912	
CALM	4.2333	0.3310	4.7333	0.3552	1.0298	0.2000
COMPOSED	4.2000	0.4244	4.4666	0.3642	0.4766	

RESULTS

The analyses of the data reveals that French Canadians attribute less credibility to the computer than do English Canadians ($t = 2.0279$, $df = 29$, $p < 0.05$) (Table 1). The analyses of the four subdivisions of

insert Table 1 about here

the scale suggests that the competence dimension caused the greatest part of the overall significance ($t = 3.2604$, $df = 29$, $p < 0.005$) (table 2)

insert Table 2 about here

as the French and English Canadians didn't differ on the remaining three subdimensions of the credibility scale; extroversion, character, and composure (Table 2). Further analysis of the scale reveals the credibility profile: English Canadians attribute greater intelligence ($p < 0.0005$), intellectual abilities ($p < 0.0005$), logical abilities ($p < 0.05$), verbosity ($p < 0.025$), extroversion ($p < 0.025$) and niceness ($p < 0.05$) to the computer than French Canadians who, in turn, attribute greater expertise to the computer than English Canadians ($p < 0.05$)

insert Table 3 about here

DISCUSSION

The results of this man-computer communication study reject the study's null hypothesis and argue that French Canadians attribute less credibility to the computer than do English Canadians. These results remain consistent with the findings of the Social Survey Research Center (1972) which reported that French Canadians reacted more negatively to the computer than did English Canadians. The Report (1972, p. 21) concluded that:

> the greatest inhibiting factor to this concept (computer) is a "closed mind" attitude (on the part of French Canadians). There is indication that people in Montreal feel overwhelmed by this omnipotent machine on their horizon and, therefore, instead of viewing it as a new piece of the scenery of the future, to be enjoyed and more important, to be developed by them, they tend to react with fear and its attendant negatives.

Low credibility appears to be an attendant negative.

Three discernible factors appear to inhibit French Canadian computer credibility; a psychological factor, a sociological factor, and a legal factor. The threat of the computer to the individual and the ensuing anxiety comprises a psychological dimension of computer reaction; the fear of further unemployment due to increased computerization figures in a sociological dimension; and the slight potential for French Canadian control of computer technology figures in the legal dimension.

The home computer will comprise part of the scenery of the future

and this part of the scenery causes consternation in French Canada:

> In Montreal the concept of a home computer arouses various concerns among people of all ages. These seem to stem from the belief that such a service would have a dehumanizing effect on life. However, unlike Toronto, the concept is initially grasped in a broader sense as possessing the power to profoundly affect the management of life (Report of the Social Survey Research Center, 1972, p. 14).

Respondents believed that such a device would lead to interference with interpersonal relationships, reduction of parental authority, and further disintegration of the family. The inability to communicate with the computer (ignorance of computer languages) also caused some psychological uncertainty.

French Canadians fear that the computer will cause higher rates of unemployment. The Report of the Royal Commission on Bilinagualism and Biculturalism tells us that the French Canadian ethnic group ranks next to the bottom of the socio-economic ladder while English speaking Canadians (British Isles) rank at the top. Consequently, threats of unemployment take on greater significance in French Canada than in English Canada which may account for some of the computer credibility variation between the language groups.

French Canadians have a slight potential for the control of computer technology. Historically, English speaking concerns have controlled the greatest part of Quebec's business and industry much as they do today. Approximately 80% of Quebec's business and industry follow the instructions of English Canadian, American, and British boards of directors (Report of the Royal Commission on Bilingualism and Biculturalism, 1969). Thus, the computer becomes associated with

domination by the English and elicits feelings of hostility reflected in the results of this study. This legal dimension in combination with the psychological and sociological dimensions help to explain the low credibility French Canadians attribute to the computer.

Communication researchers have neglected the man-computer communication phenomenon much as they have neglected communication phenomena among non-English speaking cultures. This study moved in those two novel directions simultaneously and its results raise the questions which might well direct ensuing research efforts. Man-computer communication researchers might determine the influence of computer credibility on computer oriented behavior; they might investigate the relationship between computer credibility and anxiety towards computers; and, finally, they might further isolate the demographic antecedents of computer credibility.

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